Amendments to the Claims

1. (Currently amended) A turbine engine comprising:

a plurality of disks, each disk extending radially from an inner aperture to an outer periphery;

a plurality of spacers, each spacer between an adjacent pair of said disks; and

a central shaft passing through said inner apertures and carrying the plurality of disks and the plurality of spacers to rotate about an axis with the plurality of disks and the plurality of spacers as a unit,

wherein:

said spacers include one or more first spacers having a longitudinal cross-section, said longitudinal cross-section having a first portion being essentially outwardly concave in a static condition.

2. (Original) The engine of claim 1 wherein:

said first portion has a longitudinal span of at least 2.0cm.

3. (Original) The engine of claim 1 wherein:

at least one of said first spacers is essentially unitarily formed with at least a first disk of said adjacent pair of said disks.

4. (Original) The engine of claim 1 wherein:

at least one of said first spacers has an end portion essentially interference fit within a portion of a first disk of said adjacent pair of said disks.

5. (Original) The engine of claim 1 wherein:

there are no off-center tie members holding the plurality of disks and the plurality of spacers under compression.

6. (Original) The engine of claim 1 wherein:

said longitudinal cross-section first portion is essentially outwardly concave in a running

condition of a speed of at least 5000rpm.

7. (Original) The engine of claim 1 wherein:
the shaft is a high speed shaft; and
the plurality of disks are high speed compressor section disks.

8. (Original) A gas turbine engine disk spacer comprising:
a first end portion either integrally formed with a first disk or having a surface for engaging the first disk;
a second end portion either integrally formed with a second disk or having a surface for engaging the second disk; and
an essentially annular intermediate portion having a concave outward longitudinal sectional median, said longitudinal sectional median measured without reference to any seal teeth, the spacer lacking a radially inwardly extending structural bore.

9. (Original) The spacer of claim 8 wherein:
said intermediate portion has a longitudinal span of at least 2.0cm.

10. (Original) The spacer of claim 8 wherein:
the first and second end portions and the intermediate portion are unitarily-formed of a metallic material; and
the spacer further includes at least one radially outwardly extending seal tooth.

11. (Original) The spacer of claim 8 in combination with said first and second disks and wherein:
the spacer first end portion is unitarily formed with the first disk; and
the spacer second end portion is interference fit within a collar portion of said second disk.

12. (Currently amended) A turbine engine comprising:

a central shaft; and

a rotor carried by the central shaft to rotate with the shaft as a unit and comprising:

a plurality of disks, each disk extending radially from an inner aperture to an outer periphery, the central shaft extending through the inner aperture of each disk; and

means coupling the plurality of disks, the means providing an increase in a longitudinal compression force across the rotor from a first force at a static condition to a second force at a running condition.

13. (Original) The engine of claim 12 wherein:

said running condition is characterized by a speed in excess of 5000rpm; and

said compression force essentially increases with speed continuously between said first force and said second force.

14. (Original) The engine of claim 12 wherein:

said first force is 50-200kN.

15. (Original) The engine of claim 12 wherein:

said means comprises an annular spacer portion having a longitudinal cross-section that:

in said static condition is outwardly concave with a characteristic concavity having a first value; and

in said running condition is outwardly concave with said characteristic concavity having a second value less than the first value.

16. (Original) The engine of claim 15 wherein:

the means includes at least three such annular spacer potions.

17. (Original) The engine of claim 12 wherein:

there are no off-center tie members holding the plurality of disks and the plurality of spacers under compression.

18. (Withdrawn) For a gas turbine engine comprising:

a rotor stack comprising:

a plurality of disks, each disk extending radially from an inner aperture to an outer blade-engaging periphery; and

a plurality of spacers, each spacer between an adjacent pair of said disks; and

a central shaft carrying the rotor stack and having a tie portion within the rotor stack,

a method for engineering the engine comprising:

for at least a first condition characterized by a first speed, determining a first longitudinal compression force across the rotor stack;

for at least a second condition characterized by a second speed, determining a second longitudinal compression force across the rotor stack; and

modifying at least one of the plurality of spacers so that the second longitudinal compression force exceeds the first longitudinal compression force by a target amount.

19. (Withdrawn) The method of claim 18 performed as a simulation.

20. (Withdrawn) The method of claim 18 wherein the first speed is zero.

21. (Withdrawn) The method of claim 18 performed as a reengineering of an engine configuration from an initial configuration to a reengineered configuration wherein:

the first longitudinal compression force of the reengineered configuration is less than the first longitudinal compression force of the initial configuration; and

the second longitudinal compression force of the reengineered configuration is at least as great as the second longitudinal compression force of the initial configuration.

22. (New) The engine of claim 1 wherein:

there is a precompression force across the plurality of spacers and a pretension force across an associated portion of the central shaft.

23. (New) The engine of claim 1 wherein:

there is a precompression force across the plurality of spacers and an equal magnitude pretension force across an associated portion of the central shaft.

24. (New) The engine of claim 12 wherein:

in said static condition, there is a pretension force on the central shaft equal in magnitude to the first force.